brushes brushing against the inside walls of the reactor. At the end of the reaction the solid part of the suspension was separated out from the suspension and on analysis was found to have a total sulphur content of less than 0.06%.

The same desulphating experiment was repeated with sufficient quantities to charge an industrial furnace and a charge of 14 tons of desulphated slime with a residual moisture content of 30%, to which 0.5 tons of carbon, 0.2 tons of sodium carbonate and 0.1 tons of glass were added, produced a yield of 7,320 kg of lead metal accompanied by approximately 0.4 tons of slag with a lead content of less than 10%.

Example 2

100 kg of electrode slime was charged into a cylindrical reactor with a paddle stirrer and suspended in a solution comprising 100 kg of water, 24 kg of 99% pure sodium carbonate and 8 kg of 99.5% pure sodium hydroxide. The suspension was heated to a temperature of 70°C and held at that temperature for 90 minutes. Again in this case the grinding action was applied throughout the duration of the test. At the end of the reaction the solid part of the suspension was separated out from the and on analysis was found to have a total sulphur content of less than 0.04%.

~~Example 3~~

~~100 kg of electrode slime were charged into the same~~ cylindrical reactor as in example no. 1 and ~~suspended~~ in a solution comprising 100 kg of water, 24 kg of 99% pure sodium carbonate and 5 kg of urea. The suspension was heated to a temperature of 75°C and held at that temperature for 90 minutes. Again in this case the grinding action was maintained throughout the duration ~~of the test. At the end of the reaction the solid part~~

~~of the suspension was separated out and on analysis was~~ found to have a total ~~sulphur~~ content of less than ~~0.09%.~~

~~Example 4~~

~~100 kg of electrode slime was charged into the same~~ cylindrical reactor as in example no. 1 and suspended in a solution comprising 100 kg of water, ~~24~~ kg of 99% pure sodium carbonate and 6 kg of monoethanolamine. The suspension was heated to a temperature of 70°C and held at that temperature for 90 minutes. Again in this case the grinding action was maintained throughout the duration of the test. At the end of the reaction the solid part of the suspension was separated out and on analysis was found to have a total sulphur content of ~~less than 0.07%.~~

~~Example 5~~

~~100 kg of electrode slime was charged into the same~~ cylindrical reactor as in example no. 1 and suspended in a solution comprising 100 kg of water and 22 kg of 99% pure ammonium carbonate. The suspension was heated to a temperature of 70°C and held at that temperature for 90 minutes. Again in this case the grinding action was maintained throughout the duration of the test. At the end of the reaction the solid part of the suspension was separated out and on analysis was found to have a total sulphur content of less than 0.07%. It was not necessary to add solvent of any kind in this case because the ammonium ion $(NH_4)^+$ has the power of ~~complexing lanarkite.~~

Claims

1. Process for desulphating a solid mixture resulting from the breaking up of lead-acid batteries, comprising electrode slime residues containing lead compounds belonging to the groups comprising oxides, oxysulphates (lanarkite)and sulphates, charachterised in that said lead compounds are put in contact with a aqueous solution containing alkali carbonate (sodium or potassium carbonate) in the stoichiometric quantity sufficient for sulphate concentrations present in the electrode slime, plus an excess of between 0,01% and 10%, and alkali (sodium, potassium) hydroxides which dissolve lanarkite in a molar ration of carbonate to alkali of between 1 and 2,75, in which the said lead compounds are suspended, the solid phase of the suspension being subjected to the fragmenting action of shear and compression forces exerted by brushing, scraping and compressing mechanical means.

2. Desulphating process according to claim 1, characterised in that the carbonate/solvent molar ratio is less than 1.

3. Desulphating process according to claim 1, characterised in that the ratio by weight between water and the suspended solid phase lies between 0.6 and 5, ~~preferably between 0.7 and 1.3.~~

4. Desulphating process according to claim 1, characterised in that the sodium carbonate in the said solution is in excess with respect to the stoichiometric quantity necessary for the quantity of sulphate present up to a maximum of 10 percentage points and the carbonate/alkali molar ratio may be between 1 and 2.75.

5. Desulphating process according to claim 1, characterised in that the contact time necessary for almost total conversion of the lead sulphate to lead carbonate is between 30 and 90 minutes.

6. Desulphating process according to any of the preceding claims, characterised in that it takes place at a temperature between ambient temperature and the boiling point of the solution.

7. Process according to claim 6, characterised in that it takes place at a temperature of between 60 and 100°.

8. Pyrometallurgical process for the recovery of lead from lead-acid battery electrode slime residues without the use of iron in the charge, characterised in that the said residues are first desulphated in accordance with the procedure according to claim 1 until they are substantially free of lead sulphate.